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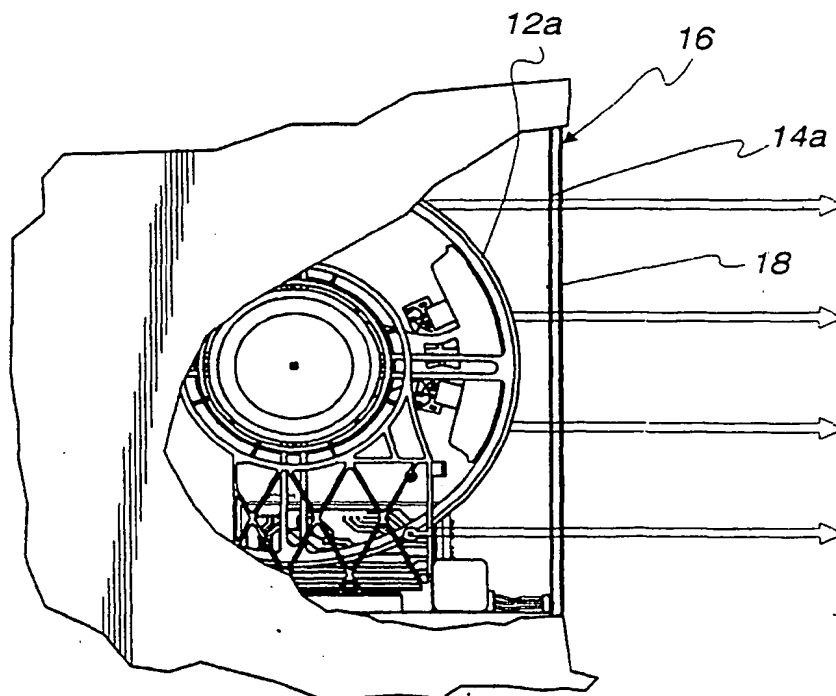
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(54) Reel spinning slot machine with superimposed video image

(57) A spinning reel slot machine comprises a plurality of mechanical rotatable reels and a video display. In response to a wager, the reels are rotated and stopped to randomly place symbols on the reels in visual association with a display area. The video display pro-

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Fig. 2a



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SEARCH REPORT

Description**FIELD OF THE INVENTION**

[0001] The present invention relates generally to reel spinning slot machines and, more particularly, to a reel spinning slot machine with a video image superimposed upon the mechanical reels of the machine.

BACKGROUND OF THE INVENTION

[0002] A reel spinning slot machine generally comprises a plurality of mechanical rotatable reels controlled, by a processor. In response to a wager, the processor randomly selects an outcome from a plurality of possible outcomes and then causes the reels to be rotated and stopped to display the selected outcome. The selected outcome is represented by certain symbols on the reels being in visual association with a display area. If the selected outcome corresponds to a winning outcome identified on a pay table, the processor instructs a payoff mechanism to award a payoff for that winning outcome to the player in the form of coins or credits.

[0003] Heretofore, the display area of reel spinning slot machines has been fairly mundane. Any proposals for changing the appearance of the display area have been fairly minor and limited in capability. For example, in U.S. Patent No. 6,056,642 to Bennett, reel symbols are colored by backlighting the symbols with colored light bulbs or similar means. In U.S. Patent No. 6,027,115 to Griswold et al., the reels themselves contain electroluminescent elements that define one or more reel symbols, such as cherries, bars, a number "7," etc. If multiple electroluminescent elements are provided for a particular symbol, that symbol may be displayed in multiple formats. Although the above proposals change the appearance of the display area to some extent, a need exists for a spinning reel slot machine with a structure capable of effecting more extravagant changes to the appearance of the display area.

SUMMARY OF THE INVENTION

[0004] Accordingly, a spinning reel slot machine comprises a plurality of mechanical rotatable reels and a video display. In response to a wager, the reels are rotated and stopped to randomly place symbols on the reels in visual association with a display area. The video display provides a video image superimposed on the reels. The video image may be interactive with the reels and include such graphics as payout values, a pay table, pay lines, bonus game features, special effects, thematic scenery, and instructional information. The present invention is advantageous in that it is capable of effecting extravagant changes to the appearance of the display area and displaying the graphics within the player's focus (i.e., the mechanical reels).

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The foregoing and other advantages of the invention will become apparent upon reading the following detailed description and upon reference to the drawings.

FIG. 1 is an isometric view of a spinning reel slot machine embodying the present invention.

FIG. 2a is a side view of the slot machine with portions broken away to reveal internal structure in accordance with a first embodiment of the present invention.

FIG. 2b is a side view of the slot machine with portions broken away to reveal internal structure in accordance with a second embodiment of the present invention.

FIGS. 3 through 10a-c are front views of a display area of the slot machine with various video images superimposed on the mechanical reels.

FIG. 11 is a block diagram of a control system suitable for operating the slot machine.

[0006] While the invention is susceptible to various modifications and alternative forms, specific embodiments have been shown by way of example in the drawings and will be described in detail herein. It should be understood, however, that the invention is not intended to be limited to the particular forms disclosed. Rather, the invention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0007] Turning now to the drawings and referring initially to FIG. 1, a spinning reel slot machine 10 comprises a plurality of mechanical rotatable reels 12a, 12b, 12c and a video display (see FIGS. 2a and 2b). In response to a wager, the reels 12a, 12b, 12c are rotated and stopped to randomly place symbols on the reels in visual association with a display area 16. Payouts are awarded based on combinations and arrangements of the symbols appearing in the display area 16. The video display provides a video image 18 occupying the display area 16 and superimposed on the reels 12a, 12b, 12c. The video image 18 may be interactive with the reels 12a, 12b, 12c, may be static or dynamic, and may include such graphics as payout values, a pay table, pay lines, bonus game features, special effects, thematic scenery, and instructional information. In the illustrated embodiment, the slot machine 10 is an "upright" version in which the display area 16 is oriented vertically relative to the player. Alternatively, the slot machine 10 may be a "slant-top" version in which the display area 16 is slanted at about a thirty degree angle toward the player of the slot machine 10.

[0008] Referring to FIGS. 2a and 2b, the video image 18 in the display area 16 may be either a direct image

from either the first reel 12a (left to right) or the third reel 12c (right to left) and span adjacent reels.

[0015] If the display area 16 includes a touch screen mounted to either the transmissive display 14a in the direct image embodiment of FIG. 2a or the glass cover in the virtual image embodiment of FIG. 2b, the video image 18 may duplicate some or all of the aforementioned keys on the button panel 24 as touch keys 26 as shown in various Figures. A player can then enable a desired function either by touching the touch screen at an appropriate touch key 26 denoted by the video image 18 or by pressing an appropriate key on the button panel 24.

[0016] Included among the plurality of basic game outcomes is a start-bonus outcome for triggering play of a bonus game. A start-bonus outcome may be defined in a number of ways. For example, a start-bonus outcome may occur when a special start-bonus symbol or a special combination of symbols appears on one or more of the reels 12a, 12b, 12c. The start-bonus outcome may require the combination of symbols to appear along an active pay line or may, alternatively, require that the combination of symbols appear anywhere on the display, regardless of whether the symbols are along an active pay line. The appearance of a start-bonus outcome causes the central processing unit to shift operation from the basic slot game to the bonus game.

[0017] As shown in FIG. 7, the video image 18 may depict the bonus game and any bonuses resulting therefrom. The bonus game may, for example, include free spins of a new set of video reels included in the video image 18. Winning combinations on the video reels may be defined by the same pay table as used for the mechanical reels or a different pay table altogether. The bonus game may be interactive and require a player to select one or more selectable elements 28 to earn bonuses. Also, the bonus game may depict one or more animated events and award bonuses based on an outcome of the animated events. Furthermore, the bonus game may be depicted by the video image 18 alone or in conjunction with a video image depicted on an optional secondary video display 40 (see FIG. 1). The two video images may be linked to appear like one unified image. Upon completion of the bonus game, the central processing unit shifts operation back to the basic slot game.

[0018] As shown in FIGS. 8a-c, 9a-c, and 10a-c, the video image 18 may be used to modify one or more symbols printed on one or more of the stopped mechanical reels 12a, 12b, 12c. For example, in response to a predetermined random or non-random event, the video image 18 may transform a reel symbol into a different symbol, such as a symbol needed to complete a winning combination. The different symbol is generated by the video image 18. In FIGS. 8a-c, the video image 18 depicts an animation transforming (e.g., "morphing") a blank symbol on mechanical reel 12b into a BELL symbol to form a winning combination of three BELL sym-

bols along pay line 22c. In addition, referring to FIGS. 9a-c, in response to a predetermined random or non-random event, the video image 18 may depict an animation in which a video indicator 29 is moved from a periphery of the display area (e.g., a corner of the display area away from the mechanical reels) to one or more of the symbols on the reels. The moving indicator 29 may identify the reel symbols to which it moves as a special symbol to be evaluated as, for example, a wild symbol or a scatter pay symbol. In FIGS. 10a-c, a video indicator 29 has moved to a CHERRY symbol on mechanical reel 12c. If the CHERRY symbol is thereby designated a wild symbol, the displayed symbol array includes a winning combination of three MELON symbols along pay line 22c where one of the three MELON symbols is formed by the wild symbol. Further, in FIGS. 10a-c, the video image 18 depicts an animation transforming a BELL symbol on reel 12c into a SEVEN symbol to form a winning combination of three SEVEN symbols along pay line 22c. The replacement SEVEN symbol generated by the video image 18 is sufficiently opaque or translucent to substantially cover the BELL symbol printed on mechanical reel 12c.

[0019] The slot machine is preferably designed to adjust the appearance of the video image 18 in terms of transparency, translucency, or opacity depending on the purpose of the video image 18. On the one hand, to permit clear viewing of the mechanical reels 12a, 12b, 12c underlying the video image 18, the portion of the video image 18 directly overlying the reels is made more transparent.

[0020] On the other hand, to facilitate viewing of the video image 18 without visual interference from the underlying mechanical reels, the video image 18 is made more opaque through proper selection of colors and their level of brightness. Also, to accentuate the video image 18 relative to the underlying reels following a reel spin, any lamps illuminating the reels during a reel spin may be turned off or dimmed following the reel spin. In addition, if the reels include blank symbols (e.g., solid white areas), any video graphics over such blank symbols will be readily visible. Similarly, any video graphics alongside, just above, or just below the underlying reels will be readily visible. Further, in the direct image embodiment of FIG. 2a, the transmissive video display 14a may be backed by an extendable opaque shade during the bonus game. The shade is retracted from the display area 16 during the basic slot game. When the central processing unit shifts operation from the basic slot game to the bonus game, the shade extends through the display area to separate the transmissive video display 14a from the underlying reels and thereby completely shield the underlying reels.

[0021] FIG. 11 is a block diagram of a control system suitable for operating the slot machine. The control system includes a central processing unit with a microcontroller 30 and system memory 32. The memory 32 preferably comprises a separate read-only memory (ROM)

and stopped to randomly place symbols on the reels (12a-12c) in visual association with a display area; and
a transmissive video (14a) display positioned in front of the reels and displaying a video image (18) superimposed upon the reels.

15. The slot machine of claim 14, wherein the transmissive video display (14a) is a liquid crystal display.
16. The slot machine of claim 14, further including a touch screen mounted to the transmissive video display (14a).

17. The slot machine of claim 14, wherein the video image (18) is interactive with the reels (12a-12c).

18. The slot machine of claim 14, wherein the video image (18) includes graphics selected from a group consisting of payout values, a pay table, pay lines (22a-22e), bonus game features, special effects, thematic scenery, and instructional information.

19. The slot machine of claim 14, wherein the video image (18) includes a bonus game feature triggered by a start-bonus outcome of one or more of the symbols on the stopped reels (12a-12c).

20. The slot machine of claim 14, wherein the video image (18) is adjustable in terms of opacity, translucency, and transparency.

21. A method of operating a spinning reel slot machine (10), comprising:

receiving a wager;
rotating and stopping a plurality of mechanical rotatable reels (12a-12c) to randomly place symbols on the reels in visual association with a display area (16); and
superimposing upon the reels a video image (18) provided by a video display (14a-14b).

22. The method of claim 21, wherein the video image (18) is a virtual image.

23. The method of claim 22, wherein the virtual image (18) is a three-dimensional image.

24. The method of claim 22, wherein the virtual image (18) is generally parallel to the display area (16).

25. The method of claim 21, wherein the video image (18) is interactive with the reels (12a-12c).

26. The method of claim 21, wherein the video image (18) includes graphics selected from a group consisting of payout values, a pay table, pay lines (22a-

22e), bonus game features, special effects, thematic scenery, and instructional information.

27. The method of claim 21, wherein the video image (18) includes a bonus game feature triggered by a start-bonus outcome of one or more of the symbols on the stopped reels (12a-12c).

28. The method of claim 21, wherein the video image (18) is adjustable in terms of opacity, translucency, and transparency.

Fig. 2a

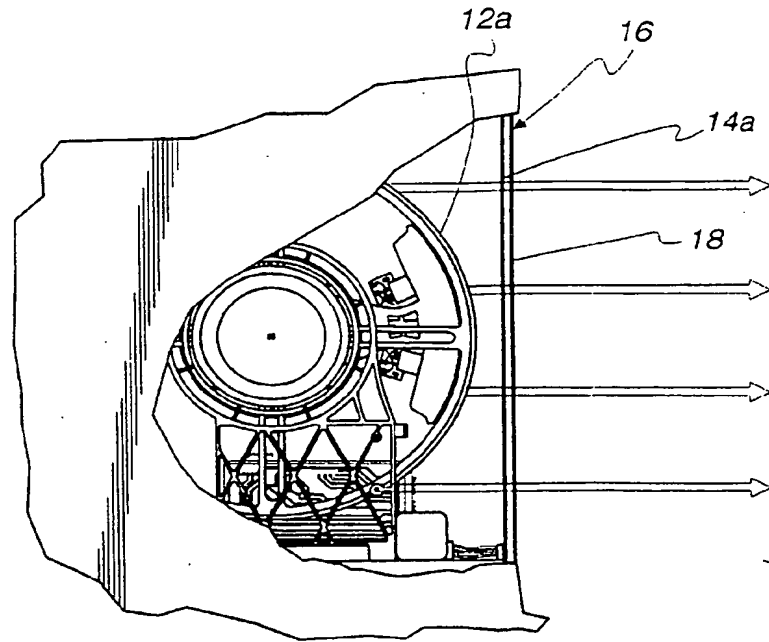


Fig. 2b

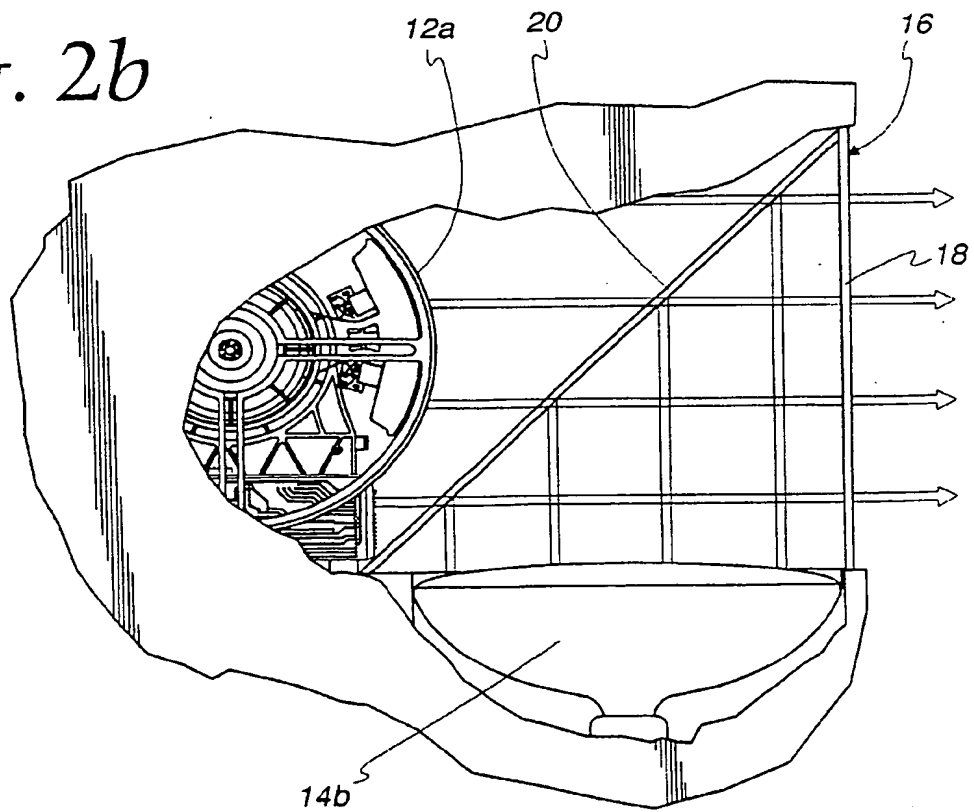


Fig. 5

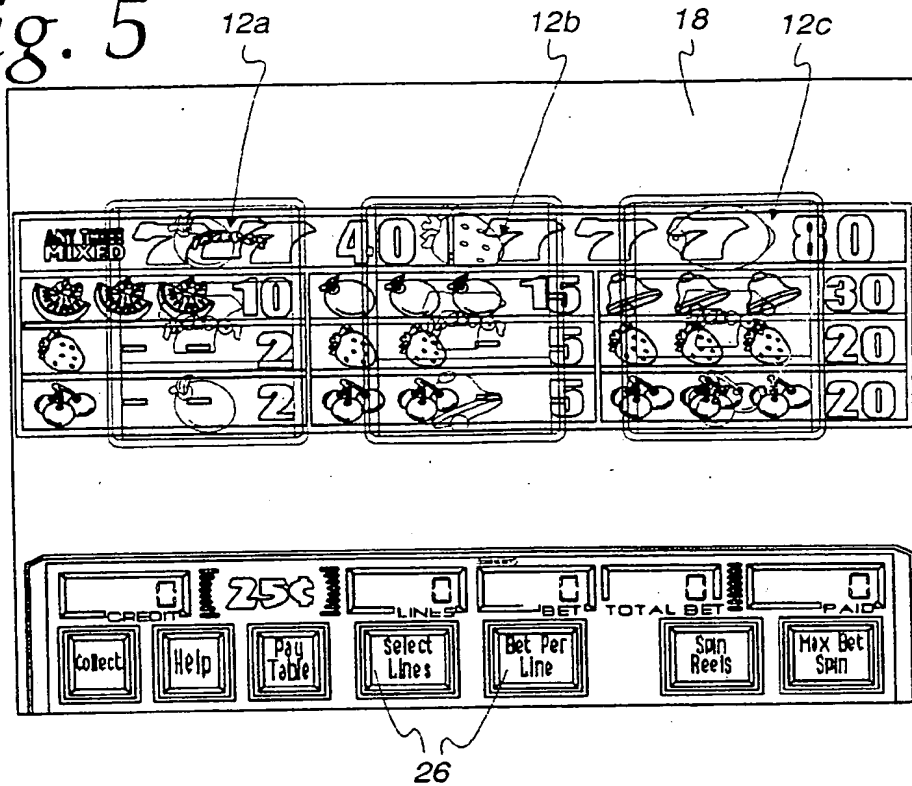


Fig. 6

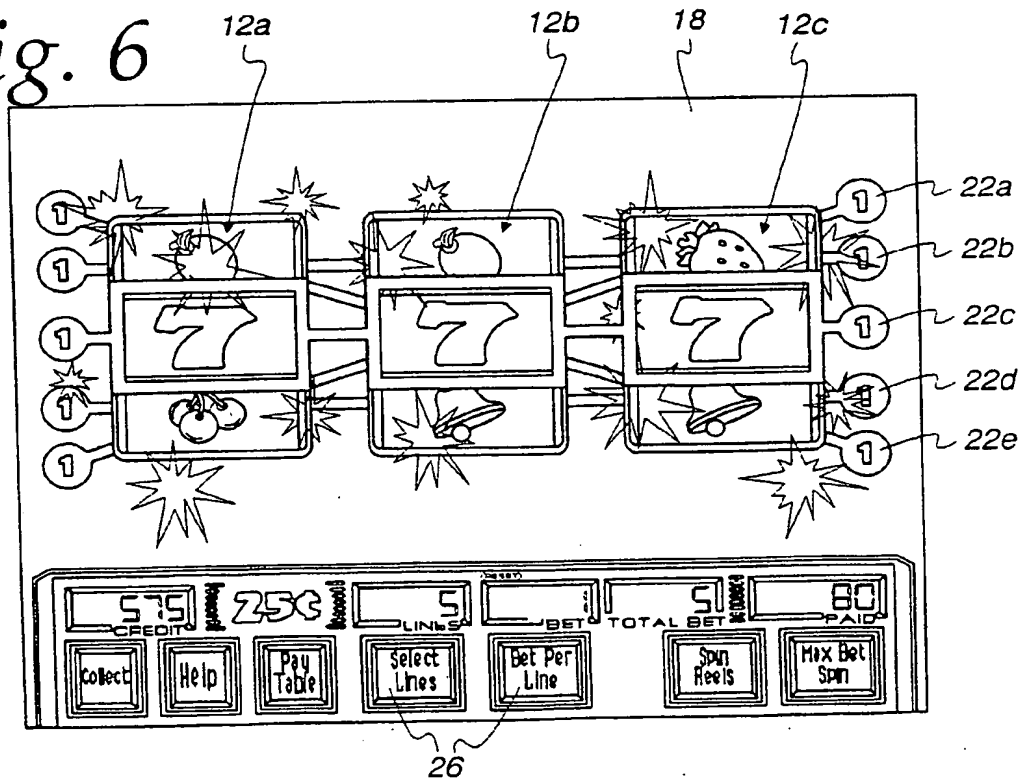


Fig. 8b

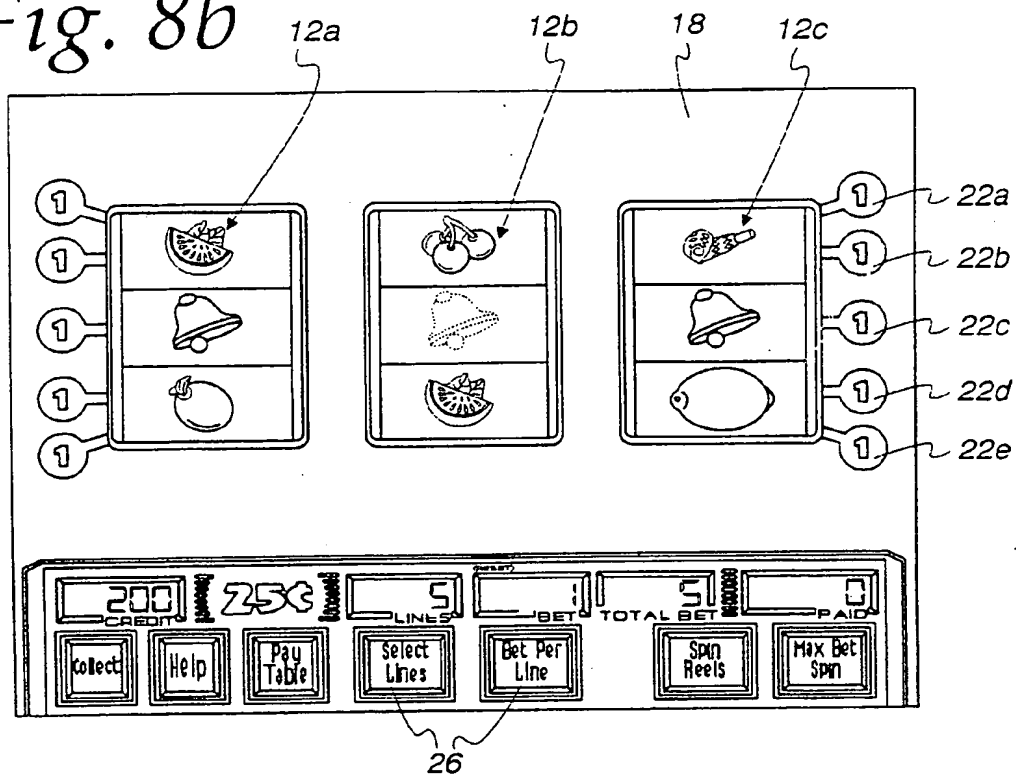


Fig. 8c

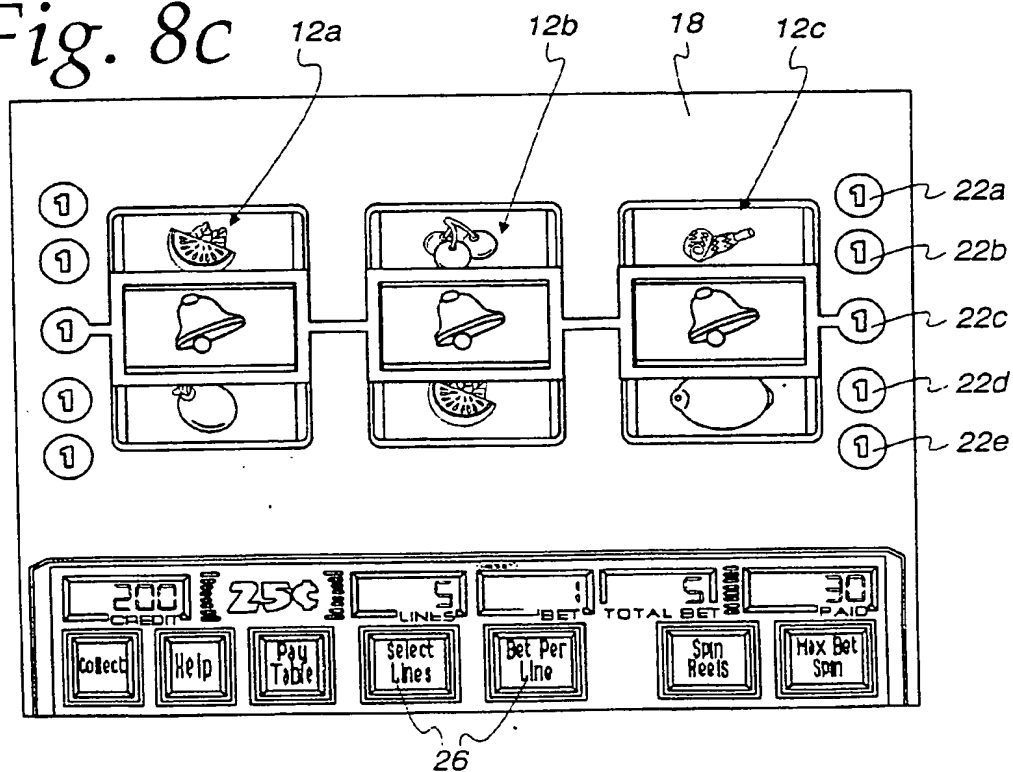


Fig. 9c

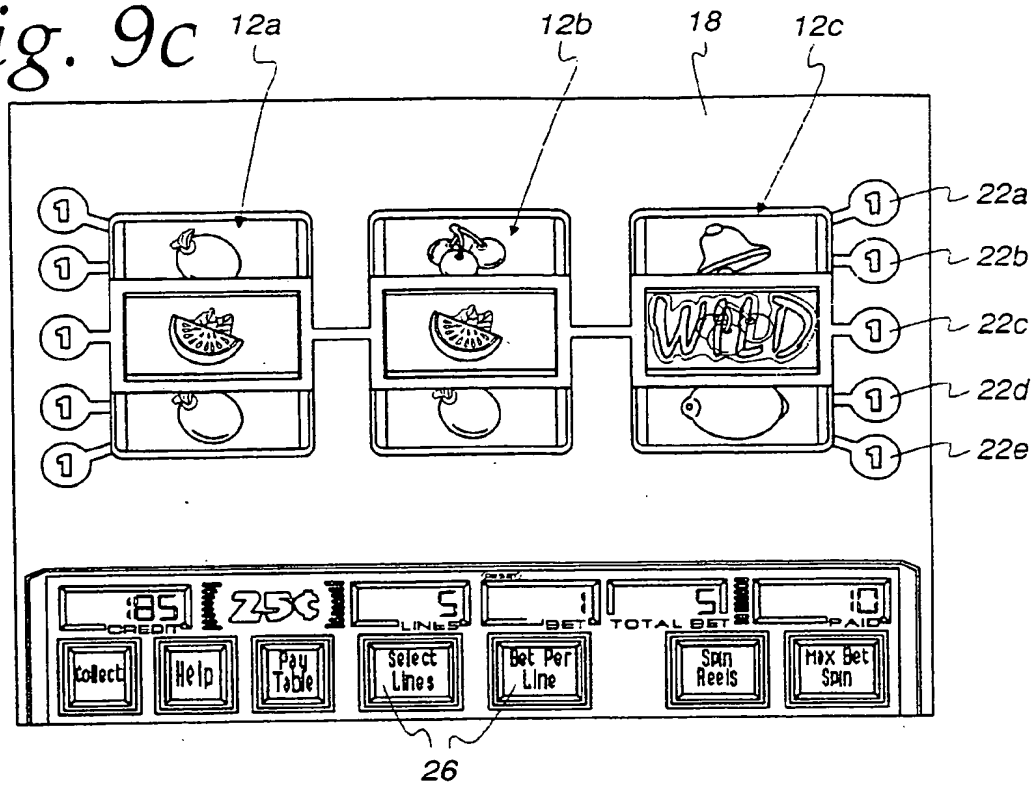


Fig. 10a

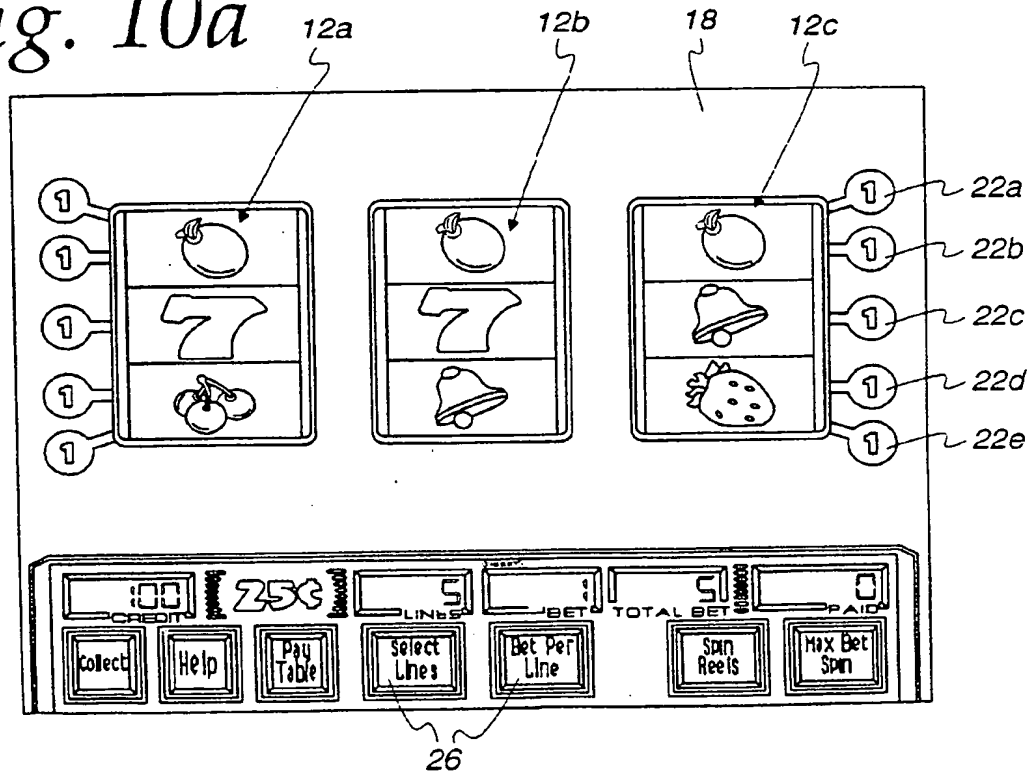
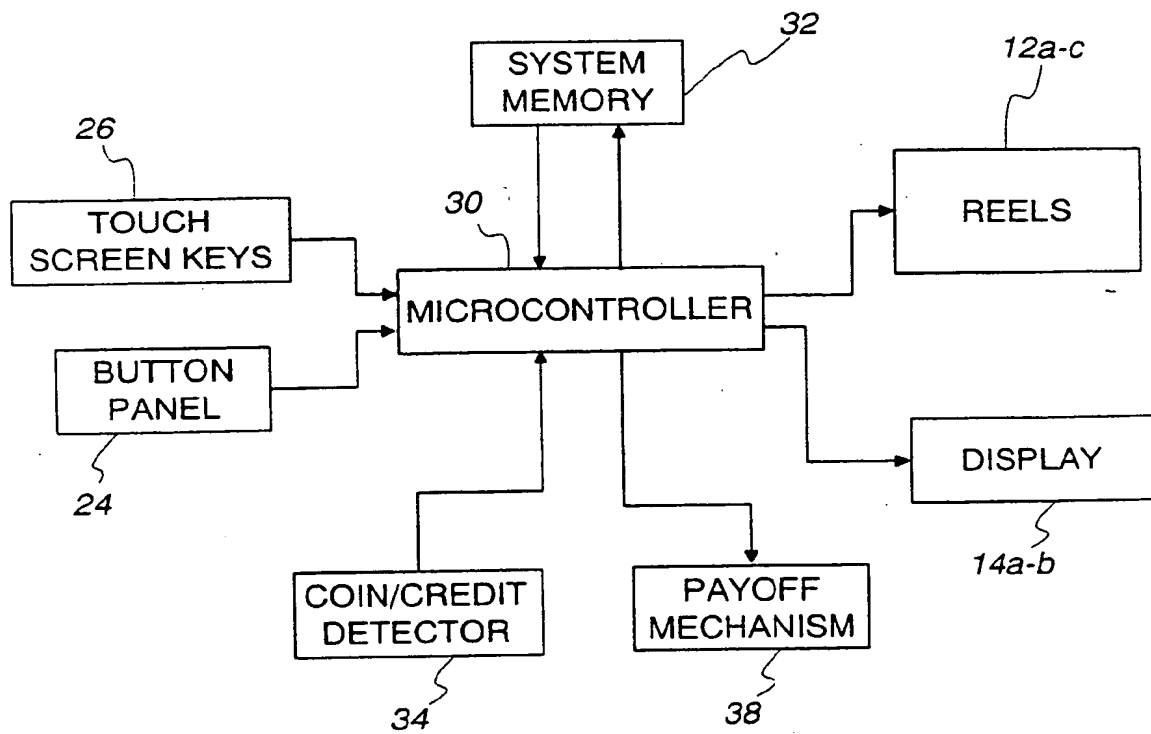
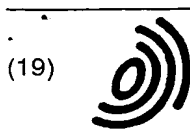


Fig. 11





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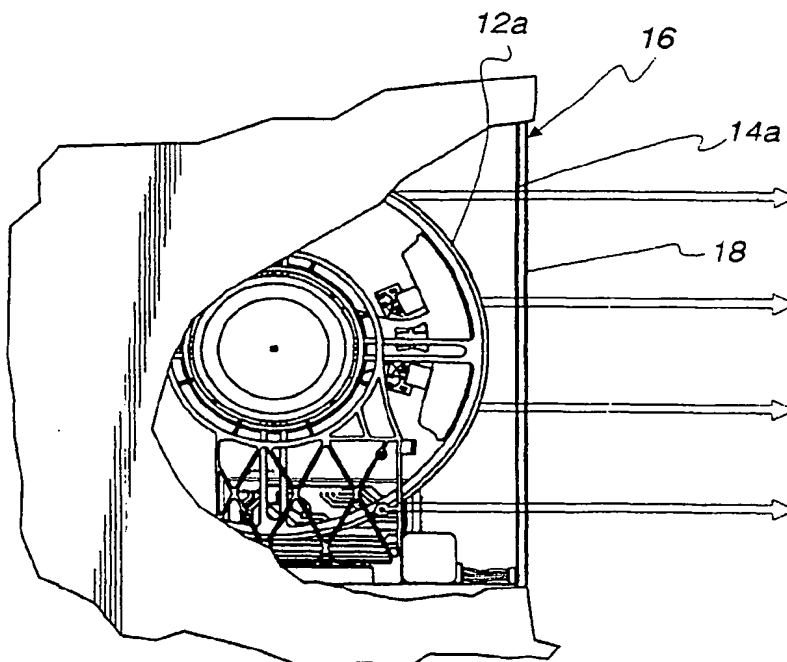
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Fig. 2a



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EUROPEAN SEARCH REPORT

Application Number
EP 02 29 1232

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The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 7 January 2003	Examiner Sisk, A
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82